

DOCKET: CU-3660

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT: Daisaku Haoto et al

SERIAL NO. 10/813,538

FILED: March 30, 2004

TITLE: PROTECTIVE COAT AND METHOD FOR MANUFACTURING
THEREOF

AMENDED CLAIMS

1. (original) A protective coat formed on the top surface of a substrate, or on the top surface of a thin film layered body formed on the substrate, comprising silicon oxynitride in which the atomic ratio of Si/O/N is 100/X/Y ($130 \leq X+Y \leq 180$, $10 \leq X \leq 135$, $5 \leq Y \leq 150$).
2. (original) The protective coat according to claim 1, wherein a thin film layered body that includes an organic luminescent layer is further formed on the top surface of the protective coat.
3. (original) The protective coat according to claim 1, wherein the protective coat is formed on a substrate having a color filter layer formed thereon.
4. (original) A method for producing a protective coat formed on the top surface of a substrate, or on the top surface of a thin film layered body formed on the substrate and comprising silicon oxynitride in which the atomic ratio of Si/O/N is 100/X/Y ($130 \leq X+Y \leq 180$, $10 \leq X \leq 135$, $5 \leq Y \leq 150$), wherein the protective coat is formed by a sputtering method in which silicon nitride is used as a target material, an inert gas is used as a sputtering gas, and N₂ is used as a reactive feed gas.
5. (original) A method for producing a protective coat formed on the top surface of a substrate, or on the top surface of a thin film layered body formed on the substrate and comprising silicon oxynitride in which the atomic ratio of Si/O/N is 100/X/Y ($130 \leq X+Y \leq 180$, $10 \leq X \leq 135$, $5 \leq Y \leq 150$), wherein the protective coat is formed by an ion plating method in which silicon nitride is used as a material and N₂ is used as a reactive feed gas.
6. (original) The method for producing a protective coat according to claim 4, characterized in that the oxygen component of the obtained protective coat

comprising the silicon oxynitride is incorporated into the composition of the protective coat by degradation of moisture that was present in the substrate or the thin film layered body or in the reaction apparatus.

7. (original) The method for producing a protective coat according to claim 4, wherein the protective coat comprising the silicon oxynitride is produced using an in-line sputtering apparatus, employing conditions of an applied output of 2.50 to 7.00 W/cm² and a distance between the target and the substrate of 12 cm or less.

8. (original) The method for producing a protective coat according to claim 6, wherein the protective coat comprising the silicon oxynitride is produced using an in-line sputtering apparatus, employing conditions of an applied output of 2.50 to 7.00 W/cm² and a distance between the target and the substrate of 12 cm or less.

9. (original) The method for producing a protective coat according to claim 5, characterized in that the oxygen component of the obtained protective coat comprising the silicon oxynitride is incorporated into the composition of the protective coat by degradation of moisture that was present in the substrate or the thin film layered body or in the reaction apparatus.

10. (original) A protective coat formed on the top surface of a substrate, or on the top surface of a thin film layered body formed on the substrate, comprising two or more layers having at least a comparatively thin first layer formed on the top surface of a substrate, or on the top surface of a thin film layered body formed on the substrate, and a comparatively thick second layer formed on the top surface of the first layer and having a different composition from the first layer.

11. (original) The protective coat according to claim 10, wherein the first layer is an oxide film and the second layer is a nitride oxide film or a nitride film.

12. (original) The protective coat according to claim 10, wherein the first layer is a SiO_x film and the second layer is SiON_x or SiN_x.

13. (original) The protective coat according to claim 12, wherein the second layer is silicon oxynitride in which the atomic ratio of Si/O/N is 100/X/Y ($130 \leq X+Y \leq 180$, $10 \leq X \leq 135$, $5 \leq Y \leq 150$).

14. (original) The protective coat according to claim 10, characterized in that the first layer does not grow in an island shape, but forms a continuous layer uniformly covering the lower layer, and has thickness of 1500 Å or less.

15. (original) The protective coat according to claim 10, wherein a thin film layered body including an organic luminescent layer is further formed on the top surface of the protective coat.

16. (original) The protective coat according to claim 10, wherein the protective coat is formed on a substrate having a color filter layer formed thereon.

17. (original) A method for producing the protective coat according to claim 10, characterized in that a protective coat comprising two or more layers of different compositions is formed in a vacuum process using the same raw materials for film formation by controlling a conveying speed, wherein the first layer is produced while being allowed to react with a component of gas emitted from the substrate or the thin film layered body formed on the substrate, and subsequently, at the time of formation of the second layer, the obtained first layer acts as a cap layer to block the gas emitted from the substrate or the thin film layered body formed on the substrate.

~~47.~~ 18. (currently amended) The method for producing a protective coat according to claim 16, characterized in that the first layer is an oxide film and the second layer is a nitride oxide film or a nitride film, wherein the oxygen component of the obtained protective coat is incorporated into the composition of the protective coat by degradation of moisture that was present in the substrate or the thin film layered body or in the reaction apparatus.